REMARKS / ARGUMENTS

In the Specification, the U.S. Patent Application Serial Number 09/979,588 has been corrected to: 08/979,588. The objection to the Specification is deemed to be overcome.

In the Original Claims, the previously submitted new claims 121-151 have been renumbered as new claims 122-152, and the originally filed claims 1-121 have been canceled. Accordingly, all objections to the claims have been addressed and corrected. Consequently, the objections to the claims are deemed to be overcome.

Claims 122 - 152 have been rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner has asserted that the specification says nothing about the features of claim 122, or of the features of dependent claims 123-152. However, with reference to Figs. 2, 7a, 7b, 7c, and 25, it will be shown that there is extensive support in the specification. (Page and line references herein refer to the parent case US Pat. Appl. Ser. No. 09/979,588, filed 11/26/1997, of which the present case is a continuation of a continuation-in-part thereof.)

Referring to page 10, lines 6-7, a "dipole" includes the coordinates of a point along an object boundary and a direction pointing substantially normal to the boundary at that point. The dipole can also include a magnitude. Fig. 25 shows image dipoles and field dipoles. Image dipoles are derived from an image of an object, and field dipoles are derived from a model pattern which can be derived from a model training image containing an example object using a feature detector, such as an edge detector, or such as the feature detector of Fig. 3. Each dipole can include a position, a direction, a magnitude, a right link, and left link, and sometimes additional information. Since an edgelet is known in the art of machine vision to include a position, a direction, and sometimes a magnitude, a "dipole" can be said to include an "edgelet". Consequently, all discussions in the specification that refer to "dipoles" also inherently refer to "edgelets", as discussed in amended claim 122, and it's dependent claims.

Thus, the claims relate to "A method for forming chains of edgelets, the edgelets being disposed within a two-dimensional array, each edgelet having a position and a direction". Fig. 5 shows a two-dimensional array of field elements. Each field dipole, i.e., "edgelet", is located within some field element, as shown in Fig. 6. Note that a plurality of boundary tangent lines 660 representing features, such as model boundary edgelets, are located within a plurality of contiguous field elements, including the shaded field element 620.

Claim 122, as now amended, relates primarily to Figs. 7a, 7b, 7c, and 25. These figures show details of the connect step 254 of the field generation module

210. Fig. 7a shows the same subset of field elements 520 of the field array 500 as was shown in Fig. 6. Fig. 7a again shows field element 620, indicated as light gray. Fig. 25 shows "dipole" data structures, each dipole having a plurality of data slots.

For every field dipole, the seeded field is examined to identify neighboring positions that contain dipoles to which the dipole should be connected. Eight neighboring positions 700 are shown surrounding field element 620. These neighboring positions 700 are examined in two steps of four neighboring positions each, each step in a particular order, determined by the direction of the field dipole corresponding to field element 620. See page 31, lines 15-20, and page 32, lines 1-2.

Referring to lines 3-6 of page 32, the two phases or "steps" of examining neighboring positions is discussed, one phase for finding a left neighbor, and one phase for finding a right neighbor, thereby supporting the phrase "the examining occurring in two phases" of amended claim 122. Fig. 7b and 7c illustrate the two phases, each phase including examination of an equal number of different neighboring positions (claim 122), in this case four neighboring positions (claim 123).

Further, the explanation of Figs. 7b and 7c on page 32, lines 9-17 clearly supports that each phase includes examination of the different neighboring positions in a particular order (claim 124), and that the particular order is

dependent upon the direction of the edgelet ("dipole") at the position in the two-dimensional array.

The remaining claims 125-152 are supported by other portions of the description of Figs. 7a, 7b, and 7c which continues up to page 33, line 7. For example, compass directions (east, west, north, south, and combinations thereof) are used in the claims to refer to the various neighboring field elements of a central field element. These more clear and more general descriptions are fully supported by the specification, including Figs. 7a, 7b, and 7c, and the description in the specification thereof. Thus, all the claims are supported by the specification of the current application and/or the related applications. Accordingly, the rejection of all the claims under 35 USC 112, first paragraph, is deemed to be overcome.

Claims 122-125, 144, 149 -152 were rejected under 35 USC 102(b) as being anticipated by Miller et al. (Template Based Method of Edge Linking Using a Weighted Decision) ("Miller").

The claims have been amended so as to be more clearly distinguished from Miller. For example, it is now more clear that claim 122 requires "for each edgelet, providing a data structure including data slots for storing: edgelet position, edgelet direction, a right link to a right-neighboring edgelet, and a left link to a left-neighboring edgelet". No such data structure is taught, suggested, or motivated by Miller. Instead, Miller teaches away, disclosing a more "global"

methodology, rather than the more "local" approach of Applicant's invention. For example, Miller states that his method "provides more than a 'local' perspective, but rather a 'global' perspective which is used to assign the pixels to the proper edge segment". (page 1810, right col., lines 5-7) Further, Miller teaches arrays that contain global information relating to an entire segment, such as "the starting and ending points of the segment, the number of pixels making up the edge segment, the composite angle of the segment, and the composite magnitude of the edge segment". (page 1810, right col., lines 11-14) By contrast, Applicant's invention as set forth in amended claim 122 teaches local information, i.e., information stored in a separate data structure that relates to each edgelet, such as the position, direction, right neighbor, and left neighbor of each edgelet.

It is now more clear that amended claim 122 also requires "for each edgelet at a position in the two-dimensional array, examining neighboring positions in two phases so as to determine which neighboring positions contain a neighboring edgelet which can be connected to the edgelet at the position, a first phase for identifying a right-neighboring edgelet, and a second phase for identifying a left-neighboring edgelet, each phase including examination of an equal number of different neighboring positions". Miller is silent on separately and explicitly identifying both a right neighbor and a left neighbor. Instead, Miller teaches merely progressive addition of edge pixels to an edge segment, with

progressive edge segment information updating, as he states on page 1810, right col., lines 15-16.

Moreover, it is now more clear that amended claim 122 requires "for each edgelet, storing from the first phase one of a right link and a null link in a first data slot of the data structure of the edgelet, and storing from the second phase one of a left link and a null link in a second slot of the data structure of the edgelet, thereby forming at least one chain of edgelets". This third element of amended claim 122 further emphasizes the two separate phases that are performed for each edgelet, and that the results of each separate phase are stored separately in respective slots of a data structure that is specific, i.e., "local", to each edgelet.

Since Miller lacks each of the three elements of amended claim 122, these amendments to independent claim 122 are deemed to clearly distinguish Applicant's invention from the teaching of Miller. Accordingly, the rejection of claim 122 is deemed to be overcome.

All of the other claims depend from amended independent claim 122, and therefore are also deemed to be allowable. Thus, the rejections of claims 123-152 are deemed to be overcome.

The prior art made of record and not relied upon does not appear to present an impediment to the allowance of the present application.

Accordingly, Applicants assert that the present application is in condition for allowance, and such action is respectfully requested. The Examiner is invited to phone the undersigned attorney to further the prosecution of the present application.

Respectfully Submitted,

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